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EXAMINER	
ABOAGYE, MICHAEL	
ART UNIT	**PAPER NUMBER**
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,024	GOLDSCHMIDT ET AL.	
	Examiner	Art Unit	
	MICHAEL ABOAGYE	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 November 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *20-25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/08/09; 08/18/08; 08/01/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I (claims 11-19) in the reply filed on 11/05/2009 is acknowledged. Claims 20-25 have been withdrawn from prosecution.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 11-19 are provisionally rejected on the ground of nonstatutory double patenting over claims 28-47 of copending Application No. 11/989,214. This is a provisional double patenting rejection since the conflicting claims have not yet been patented. Although the conflicting claims are not identical, they are not patentably

distinct from each other because the claimed disclosures of the cooling drums share at least the following structural features: a component repair method of applying a solder in a region of the component to be repaired wherein the solder comprises at least one constituent whose melting temperature is lower than the melting temperature of the component base material; and heating the solder with a heat source; melting the solder material by the heat source wherein the component base material is not heated; generating a temperature gradient in the region of the component to be repaired during the heating step to produce an oriented microstructure in the repaired site which comprises the same oriented microstructure as the surrounding base material. Though the Copending Application recites directional microstructure instead of oriented microstructure as in the instant claimed invention, however, one of ordinary skill in the art would readily appreciate that two terminologies mean substantially the same, and they are used synonymously or alternatively in the art. The instant application claimed invention broadly recite a repair method conducted at a soldering temperature lower than the melting point of the base material, while the copending application claims specific temperatures at which soldering is conducted that is lower than the melting point of the base material, regardless the two claimed inventions are clearly coextensive in scope with each other.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11-19 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 11, it is unclear, what applicant means by " wherein the component base material is not heated", because one reading the entire specification would readily appreciate that, though local heating is applied, and a temperature below the melting point of the base material is generated to melt the solder, it is reasonable to expect the base material to be heated to some extent due to thermal conduction. However if Applicant meant "wherein the component base material is not melted", the appropriate revision and clarification is requested. For prosecution purposes said claim limitation is interpreted by the Examiner as "wherein the component base material is not melted".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Baumann et al. (US Patent No. 6,050,477).

Regarding claim 11, Baumann et al. teaches a repair method (see, column 1, lines 60-63) for repairing a component having a base material with an oriented microstructure (equated to the directionally solidified component, see, column 1, lines

29-35), comprising: applying a solder (equated to the braze material (8), see, column 2, lines 25-30) in a region of the component to be repaired wherein the solder comprises a constituent whose melting temperature is lower than the melting temperature of the component base material; and heating the solder with a heat source; melting the solder material by the heat source wherein the component base material is not melted (see, abstract; column 1, lines 45-51), generating a temperature gradient in the region of the component to be repaired during the heating step to produce an oriented microstructure in the repaired site which comprises the same oriented microstructure as the surrounding base material (see, column 1, lines 45-51, column 2, lines 41-50, column 2, line 66-column 3 , lines 1-18 and figures 3 and 4). (Note, the claim recite soldering method, however one reading the specification as a whole and the fact that the base material is made of a nickel based super-alloy material, a filler material or solder material that is required to have similar material characteristics as the base material would be expected to be a high temperature alloy whose melting point exceed the dictionary definition of "soldering". therefore the claimed soldering is rather interpreted by the examiner as a brazing process. Soldering and brazing are process terminologies used interchangeable in the art.

Regarding claim 12, Baumann et al. teaches a repair process wherein the temperature gradient extends in the direction of the orientation of the oriented microstructure of the component base material (see, column 2, lines 45-60).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baumann et al. (US Patent No. 6,050,477) as described in claim 11 and further in view of McComas et al. (US Patent No. 4,705,203).

Baumann et al. teaches substantially all the limitations in a similar way as in the rejection of claim 1, however fails to teach a soldering/ brazing comprising a dual or two constituents as claimed.

McComas et al. teaches a repair method of a nickel super-alloy article; wherein the solder comprises a first constituent (layer 15) with a melting temperature lower than a melting temperature of the component base material and a second constituent (second layer 25) having a high durability and a melting temperature greater than the first constituent melting temperature but below the base material melting temperature, and the solder is applied in the region of the component to be repaired such that the proportion of first constituent in the solder is greater in the vicinity of the base material than in a portion of the component to be repaired further away from the base material (column 2, lines 26-38, column 3, lines 8-40 and column 4, lines 29-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Baumann et al. to use soldering/ brazing comprising

a dual alloy or two constituents, since the use of said soldering/ brazing technique is known in the art as exemplified by McComas et al., and that said technique allows certain compositional modifications at the repair region to be made to suit particular or desired circumstances or achieve desire results (McComas et al., column 4, lines 28-55).

Regarding claim 14, Baumann et al. teaches a temperature gradient generated that is produced by an inductive heating source (column 2, lines 17-30).

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baumann et al. (US Patent No. 6,050,477) as described in claim 11 and further in view of Pietruska et al. (US Patent No. 6,503,349).

Baumann et al. teaches substantially all the limitations in a similar way as in the rejection of claim 1, however fails to teach a soldering/ brazing comprising a dual or two constituents as claimed.

Pietruska et al. teaches a repair method of a nickel super-alloy article; wherein the solder comprises a first constituent with a melting temperature lower than a melting temperature of the component base material and a second constituent having a high durability and a melting temperature greater than the first constituent melting temperature but below the base material melting temperature (column 3, lines 35-40), and the solder is applied in the region of the component to be repaired such that the proportion of first constituent in the solder is greater in the vicinity of the base material

than in a portion of the component to be repaired further away from the base material (column 3, line 50-column 3, line 15, column 3, lines 45-50).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Baumann et al. to use soldering/ brazing comprising a dual or two constituents, since the use of said soldering/ brazing technique is known in the art as exemplified by Pietruska et al. and said technique allows certain compositional modifications at the repair region such providing grain boundary strengthener or repair joint strengtheners repair alloys to be provided (Pietruska et al. ., column 5, lines 5-20).

Regarding claim 14, Baumann et al. teaches a temperature gradient generated that is produced by an inductive heating source (column 2, lines 17-30).

10. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumann et al. (US Patent No. 6,050,477) and McComas et al. (US Patent No. 4,705,203) as applied to claim 14 above and further in view of Giglioti et al. (US Patent No. 6343641).

Regarding claim 15 and 16, Baumann et al. and McComas et al. fail to teach temperature gradient produced by the casting furnace that produces a cast piece with a directionally oriented microstructure, or a temperature gradient that is produced by a hot box.

Giglioti et al. teaches a method of directional solidification of a nickel super alloy; wherein temperature gradient (see, column 1, lines 60-65) is produced by a hot box (14,

figure 3, and column 4, lines 9-15). (Note, hot box is defined in Applicant's specification para [0023], as "essentially intended to mean a device with a compartment for holding the component to be repaired" the heating device of Giglioti et al. comprises a compartment or furnace box 14 for holding the component to be repaired, hence said device reads and/or equated to the claimed hot box).Giglioti et al. also teaches casting furnace as an alternative heating means for generating temperature gradient (see, Giglioti et al., column 4, lines 32-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined process of Baumann et al. and McComas et al. to use any one of a hot box and a casting furnace for generating temperature gradient, since said devices or processes are known in the art as alternative heating means for directional solidification of nickel super alloy as exemplified by Giglioti et al., and by selecting any one of said alternative means of generating temperature gradient during directional or oriented solidification would have only yielded a predictable result (see, Giglioti et al., column 4, lines 9-15 and lines 32-35).

Regarding claim 17, Baumann et al. teaches substantially similar essentially features as in the claimed invention including: heating the solder with a heat source base material is heat treated during the soldering step and generating a temperature gradient in the region of the component to be repaired during the heating step, therefore it would necessarily flow that the base material would be heat treated as claimed since the base material is subject to a similar process/heating steps.

Regarding claim 18, Baumann et al. does not specifically state the form or physical state of the brazing/solder material. Hence the form or the state of the solder material is not critical in the invention of Baumann et al.

McComas et al. teaches solder/brazing material that is in the form of a powder (McComas et al. Abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined process of Baumann et al. and Giglioti et al., to use solder/brazing material in the form of a powder, since the use solder/brazing material in such physical form is known as disclosed by McComas et al., therefore selecting to use solder powder would have only yielded a predictable result (McComas et al. Abstract).

11. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumann et al. (US Patent No. 6,050,477) and Pietruska et al. (US Patent No. 6,503,349) as applied to claim 14 above and further in view of Giglioti et al. (US Patent No. 6343641).

Regarding claim 15 and 16, Baumann et al. and Pietruska et al. fail to teach temperature gradient produced by the casting furnace produces a cast piece with a directionally oriented microstructure, or a temperature gradient is produced by a hot box.

Giglioti et al. teaches a method of directional solidification of a nickel super alloy; wherein temperature gradient (see, column 1, lines 60-65) is produced by a hot box (14, figure 3, and column 4, lines 9-15). (Note, hot box is defined in Applicant's specification

para [0023] as “essentially intended to mean a device with a compartment for holding the component to be repaired” he heating device of Giglioti et al. comprises a compartment or furnace box 14 for holding the component to be repaired, hence said device reads and/or equated to the claimed hot box).Giglioti et al. also teaches casting furnace as an alternative heating means for generating temperature gradient (see, Giglioti et al., column 4, lines 32-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined process of Baumann et al. and Pietruska et al. to use any one of a hot box and a casting furnace for generating temperature gradient, since said devices or processes are known in the art as alternative heating means for directional solidification of nickel super alloy as exemplified by Giglioti et al., and by selecting any one of said alternative means of generating temperature gradient during directional or oriented solidification would have only yielded a predictable result (see, Giglioti et al. , column 4, lines 9-15 and lines 32-35).

Regarding claim 17, Baumann et al. teaches substantially similar essentially features as in the claimed invention including: heating the solder with a heat source base material is heat treated during the soldering step and generating a temperature gradient in the region of the component to be repaired during the heating step, therefore it would necessarily flow that the base material would be heat treated as claimed since the base material is subject to a similar process/heating steps.

Regarding claim 18, Baumann et al. does not specifically state the form or physical state of the brazing/solder material. Hence the form or the state of the solder material is not critical in the invention of Baumann et al.

Pietruska et al. teaches solder/brazing material that is in the form of a powder or tape (equated to film) or paste (Pietruska et al., column 3, lines 36-40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined process of Baumann et al. and Giglioti et al., to use solder/brazing material in the form of a powder or tape (equated to film) or paste, since the use solder/brazing material in one of said physical form is known as disclosed by Pietruska et al., therefore selecting to use any one of the known alternative physical forms of solder would have only yielded a predictable result (Pietruska et al., column 3, lines 36-40).

12. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baumann et al. (US Patent No. 6,050,477), Pietruska et al. (US Patent No. 6,503,349) and Giglioti et al. (US Patent No. 6343641) as applied to claim 18 above and further in view of Philip (US Patent No. 7,416,108).

Baumann et al. , Pietruska et al. and Giglioti et al., fail to teach solder in a form of nanopowder.

Philip teaches a method of repairing a super alloy component using solder in a form of nanopowder (see, column 3, lines 1-15 and column 4, lines 51-67).Philips

teaches that nano-particles of an alloy or solder are known to exhibit lower incipient surface melting temperature than the melting of the bulk alloy (se, column 3, lines 1-15).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined process of Baumann et al Pietruska et al. and Giglioti et al., to use solder in a form of nanopowder, since the use of solder in such particle size is known in the art as exemplified by Philip, and that would allow soldering/repairing to be conducted at a lower temperature, which is much more economical since a lesser heat input requirement (see Philip, column 3, lines 1-15).

13. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baumann et al. (US Patent No. 6,050,477), McComas et al. (US Patent No. 4,705,203) and Giglioti et al. (US Patent No. 6343641) as applied to claim 18 above and further in view of Philip (US Patent No. 7,416,108).

Baumann et al., McComas et al. and Giglioti et al., fail to teach solder in a form of nanopowder.

Philip teaches a method of repairing a super alloy component using solder in a form of nanopowder (see, column 3, lines 1-15 and column 4, lines 51-67).Philips teaches that nano-particles of an alloy or solder are known to exhibit lower incipient surface melting temperature than the melting of the bulk alloy (se, column 3, lines 1-15).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined process of Baumann et al., McComas et al. and Giglioti et al., to use solder in a form of nanopowder, since the use of solder in such

physical/dimensional from is known in the art as exemplified by Philip, and that would allow soldering/repairing to be conducted at a lower temperature, which is much more economical since a lesser heat input requirement (see Philip, column 3, lines 1-15).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Messelling (US 6283356), Gerasimov et al. (Pub.No. US 2001/0001415) and Ballie (US 6523599) are also cited in PTO-892.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. A./
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793